

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : John Mantegna et al

Art Unit : 2155

Serial No. : 09/845,084

Examiner : David R. Lazaro

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Title : TEMPORAL DRIFT CORRECTION

MAIL STOP AF

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

REPLY TO ACTION OF APRIL 5, 2006

Applicant asks that all claims be allowed in view of the following remarks. Claims 1-26 are pending, with claims 1, 10 and 17 being independent.

Claims 1, 3-5, 10, 12-14, 17, 19-21 and 24-26

Claims 1, 3-5, 10, 12-14, 17, 19-21 and 24-26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cohen (U.S. Patent No. 5,825,771) in view of Borella (U.S. Patent No. 6,434,606 B1). Applicant requests withdrawal of the rejection because none of Cohen, Borella or any proper combination of the references describe or suggest the subject matter of the independent claims. For example, none of Cohen, Borella or any proper combination of the references describe or suggest determining a parameter that relates to and amplifies temporal drift based on a weighted comparison result and, based on the determined parameter, determining a number of samples to be inserted in or removed from a playback data block.

Independent claim 1 recites a method for temporal drift correction in a real-time electronic communication. The method includes measuring a size of a receiving data buffer and comparing the measured size of the receiving data buffer to a predetermined nominal data buffer size to produce a comparison result. The method includes weighting the comparison result. The method includes determining a parameter that relates to and amplifies the temporal drift based on the weighted comparison result and determining, based on the determined parameter, a number of samples to be inserted in or removed from a playback data block. The method also includes modifying the playback data block by inserting or removing a number of samples that is based on the determined number of samples.

The Office action contends that Cohen discloses determining a parameter that relates to and amplifies the temporal drift based on a comparison result and determining, based on the determined parameter, a number of samples to be inserted in or removed from a playback data block. See Office action of April 5, 2006 at page 3 (citing Cohen at col. 8, line 56 to col. 9, line 20). Applicant respectfully disagrees.

Cohen describes an audio transceiver which, on the receiving side, controls the amount of audio data in a buffer of a PC audio device so that the audio device always has something to play. See Cohen at abstract. To do so, Cohen describes determining a current amount of data in the playback buffer. See Cohen at col. 8, lines 23-31. Cohen then determines a difference between the current amount of data in the buffer and a desired fullness level of the buffer. See Cohen at col. 8, lines 59-61. Cohen describes processing data to be sent to the playback buffer to force the difference to be as close to zero as possible. See Cohen at col. 8, lines 62-64. The processing of Cohen involves adding or removing audio samples as a direct function of the determined difference based on a lookup table. See Cohen at col. 8, line 65 to col. 9, line 20 (emphasis added). For example, if the difference is 500 msec, the lookup table of Cohen prescribes removing 1 frame for every 20 frames. See table at col. 9, line 12 (as reproduced below).

Difference (in msec)	Duplication amount
500	-1 per 20 = -5%
300	-1 per 50 = -2%
150	-1 per 100 = -1%
-150	+1 per 100 = +1%
-300	+1 per 50 = +2%
-500	+1 per 20 = +5%

where +1 and -1 indicate addition and removal of a frame and "per X" indicates for every X frames. See table at col. 9, lines 10-20.

It is clear from this table that Cohen does not apply a parameter to a difference to derive a number of samples to be added or removed. Consequently, it is clear that Cohen is devoid of any teaching of a determination of a parameter that relates to and amplifies temporal drift, based on a comparison between the current amount of data and a desired fullness level or otherwise. Stated

differently, Cohen does not describe or suggest determining a parameter that relates to and amplifies temporal drift based on a weighted comparison result and, based on the determined parameter, determining a number of samples to be inserted in or removed from a playback data block, as recited in independent claim 1.

The Office action recognizes that Cohen does not explicitly disclose a weighted comparison result. See Office action of April 5, 2006 at page 3. For this deficiency, the Office action therefore relies on Borella. See Office action of April 5, 2006 at page 4 (citing Borella at col. 19, lines 29-40). Applicant also respectfully disagrees with this position.

Borella describes two jitter buffers for receiving data frames from a buffer management device and buffering the data frames. See Borella at abstract. Borella also describes selecting one of the two jitter buffers based on the quality of the two jitter buffers. See Borella at abstract. Jitter buffer quality describes a quality of service provided by the jitter buffer during a previous period of time, and is determined based on buffer depth, mean loss rate and bandwidth. See Borella at col. 18, line 61 to col. 19, line 18. To avoid rapid switching between the two jitter buffers due to large differences in periodic jitter buffer quality values (caused by dramatic network behavior changes), Borella describes using an exponentially weighted moving average over a window of the last n data frames (or talk spurts) to determine samples of each jitter buffer to be used in the quality determination. See Borella at col. 19, lines 33-40. The jitter buffer quality, based on the weighted samples, then may be compared to determine which jitter buffer will be selected. See Borella at col. 19, lines 25-28.

As such, Borella calculates the fullness of the jitter buffers through the use of an exponentially weighted moving average of data, so as to normalize aberrations in raw data and thus enable a more reliable comparison among buffers. Borella, however, does not apply any weighting to a result of the comparison between jitters associated with the buffers, as claimed.

Notably, the application of a weight against the comparison result (between a target value and an actual measurement) enables amplification of the difference therebetween, and thus enables a more dramatic change to a parameter affecting correction of temporal drift via sample addition or removal. Borella does not contemplate any such amplification. Thus, Borella does not describe or suggest weighting the result of a comparison between a measured size of a receiving data buffer and a predetermined nominal data buffer size, as recited in independent claim 1.

Moreover, Borella also does not remedy the deficiency of Cohen to describe or suggest determining a parameter that relates to and amplifies temporal drift based on a weighted comparison result and, based on the determined parameter, determining a number of samples to be inserted in or removed from a playback data block, also as recited in independent claim 1. Nor does the Office action contend that it does.

Accordingly, none of Cohen, Borella or any proper combination of the references describe or suggest determining a parameter that relates to and amplifies temporal drift based on a weighted comparison result and, based on the determined parameter, determining a number of samples to be inserted in or removed from a playback data block, as recited in independent claim 1. For at least these reasons, applicant respectfully requests reconsideration and withdrawal of the rejection of independent claim 1 and claims 3-5 and 24 that depend therefrom.

Independent claim 10 recites a computer program, residing on a computer-readable medium, that includes instructions for causing a computer to correct temporal drift in a real-time electronic communication in a manner corresponding to that of independent claim 1, and independent claim 17 recites a computer system running programmed processes that cause the computer system to do the same. Accordingly, for the reasons noted above with respect to independent claim 1, applicant requests reconsideration and withdrawal of the rejection of independent claims 10 and 17 along with claims 12-14, 19-21, 25 and 26 that depend therefrom.

Claims 2, 6-9, 11, 15, 16, 18, 22 and 23

Claims 2, 6-9, 11, 15, 16, 18, 22 and 23, which depend from independent claims 1, 10 and 17, respectively, have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cohen in view of Borella and Hodson (“Skew Detection and Compensation for Internet Audio Applications”). As discussed above with respect to independent claims 1, 10 and 17, Cohen and Borella, either alone or in combination, fail to describe or teach the features in the independent claims. Hodson describes detection of, and compensation for, audible interruptions in audio streams due to unsynchronized clocks between a source and a receiving application. See Hodson at abstract. Hodson detects, and compensates for, clock skew by attempting to maintain the playback buffer occupancy within a constrained region. See Hodson at § 2. Hodson, however, does not cure the failure of Cohen, Borella or any proper combination of the references to describe or suggest determining a parameter that relates to and amplifies temporal drift based on

a weighted comparison result and, based on the determined parameter, determining a number of samples to be inserted in or removed from a playback data block. Nor does the Office Action contend Hodson does. For at least this reason, and based on their dependency from independent claims 1, 10 and 17, applicant respectfully requests withdrawal of the rejection of claims 2, 6-9, 11, 15, 16, 18, 22 and 23

Conclusion

It is believed that all of the pending issues have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this reply should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this reply, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fee is believed due. Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

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W. Karl Renner
Reg. No. 41,265

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331
40348373.doc